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ABSTRACT

A high-resistance silicon wafer is manufactured in which a gettering ability, mechanical strength, and economical efficiency are excellent and an oxygen thermal donor is effectively prevented from being generated in a heat treatment for forming a circuit, which is implemented on the side of a device maker. A heat treatment for forming an oxygen precipitate nucleus is performed at 500 to 900°C for 5 hours or more in a non-oxidizing atmosphere and a heat treatment for growing an oxygen precipitate is performed at 950 to 1050°C for 10 hours or more on a high-oxygen and carbon-doped high-resistance silicon wafer in which resistivity is 100 Ωcm or more, an oxygen concentration is 14×10^{17} atoms/cm³ (ASTM F-121, 1979) or more and a carbon concentration is 0.5×10^{16} atoms/cm³ or more. By these heat treatments, a remaining oxygen concentration in the wafer is controlled to be 12×10^{17} atoms/cm³ (ASTM F-121, 1979) or less. Thus, there is provided a high-resistance, low-oxygen and high-strength silicon wafer in which resistivity is 100 Ωcm or more and an oxygen precipitate (BMD) having a size of 0.2 μm is formed so as to have high density of $1 \times 10^4/\text{cm}^2$ or more.